

REMARKS:

United States Serial No. 10/808,618 was filed on March 24, 2004. In view of the amendments and remarks set forth herein, Applicants respectfully request reconsideration and allowance of claims 1-12, 15-41, and 99-155. Further, Applicants request rejoinder and allowance of withdrawn claims 20-25, 31, 106-120, 125 and 129-151.

RECOGNITION OF INFORMATION DISCLOSURE STATEMENTS:

Applicants note the Office Action comments regarding a listing of patents being required to be submitted in a separate paper to be considered by the Patent Office. Applicants further note that 44 pages of forms PTO/SB/08A and PTO/SB/08B containing such a listing accompanied the Office Action, with the cited art having been initialed by the Examiner as having been considered.

ALLEGATION OF EFFECTIVE FILING DATE:

Applicants note the comments in the Office Action with respect to the alleged "effective filing date" of the elected species. Applicants reserve the right to traverse this finding should it become relevant to the substantive examination of the application.

STATUS OF THE CITED APPLICATIONS:

Applicant hereby replies to the requirement in the Office Action that the status of the patented and abandoned applications cited in the specification be updated. Several paragraphs of the specification have been amended as noted above. None of these changes add any new matter to the specification. While almost all of these changes are made solely for the purpose of complying with the requirement in the Office Action that the status of the patented and abandoned applications cited in the specification be updated, there are some minor changes made to correct misspellings and other minor typographical errors as described below. In the interest of brevity,

the Applicant submits that all amendments to the specification are made to update the status of the patented and abandoned applications cited in the specification, unless otherwise noted below.

AMENDMENTS FOR CLARITY AND GRAMMAR:

In the paragraph at page 1, lines 8-14, the commas separating different applications from one another have been replaced with semi-colons to improve readability.

The first amendment in the paragraph at page 43, lines 8-13, is made to avoid any unintended implication of a hierarchy in the embodiments. The second amendment in the paragraph at page 43, lines 8-13, corrects a typographic error, adds no new matter, and is fully supported by the material in the original specification at claim 34, lines 1-2.

The paragraph at page 111, line 2-22, has been amended to correct the spelling of "Nanoelectrical" at line 6 and to correct the spelling of "Magnetically" at line 19.

The heading at page 112, lines 1-5, has been amended to correct the serial number to show a comma instead of a forward slash (/) delimiting the digits.

ANTECEDANT BASIS OF CLAIM 34:

Applicant hereby replies to the objection in the Office Action that the size range in claim 34 is not taught in the specification. The specification has been amended to correct the typographical error at page 43, line 8-13, to recite the size range taught in claim 34 of the original specification. Applicant submits that this amendment does not add new matter to the specification because the matter had been previously included in self-supporting original claim 34 of the specification.

INFORMALITIES OF CLAIM 8:

Applicant hereby replies to the objection to claim 8 due to the allegations in the Office Action that the Markush group lists "magnesium" twice. Claim 8 has been amended to delete the second occurrence of "magnesium".

REJECTIONS UNDER 35 U.S.C. §112, FIRST PARAGRAPH:

Applicant hereby replies to the rejections of claims 1-12, 14-19, 26-30, 32-41, 99-105, 121-124, 126-128, and 152-155 due to the allegations in the Office Action that the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. The Office Action alleges that there is no disclosure in the specification of magnetic nanoparticles dispersed in a polymeric carrier; that the particles in a binder are distinct from the particles dispersed in a polymeric carrier; that there is no disclosure of nanoparticles of iron, nitrogen and a third distinct atom; that there is no disclosure of iron, nitrogen, and aluminum; and that the nanoparticles do not have the properties claimed in claims 99-105, and 152-155. Applicant respectfully traverses each of these allegations and the overall conclusion below.

This rejection is not well taken, in part as there is no discussion of why claims 1-10, 12, 26-28, and 32-41 have been rejected.

Regarding the allegation in the Office Action that there is no disclosure in the specification of magnetic nanoparticles dispersed in a polymeric carrier, Applicant submits that the original specification disclosed a composition comprised of nanomagnetic particles disposed within a polymeric carrier. Original Specification, Claim 64. In the corrective amendment of Response B, Applicants replaced claim 64 with identical claim 121. The present amendment to the specification explicitly recites that the composition comprises nanomagnetic particles disposed within a polymeric carrier, as supported by original claim 64. Page 175 following line 2. Further, the specification discloses a listing of carriers which may be polymeric or

non-polymeric for containing/delivering therapeutic agents. See page 173, line 14 to page 175, line 2. Certain of these disclosed polymeric carriers are recited in claims 122, 123, 124, and 127 depending from claim 121 (original claims 65, 66, 67, and 70 depending from claim 64.) The disclosure of carrier types continues with a disclosure of carrier forms on page 175 to page 178, line 12, and a description of therapeutic compositions disposed in the carriers continues to page 179, line 11. This disclosure regarding carriers and therapeutic compositions concludes with a sentence reciting that the nanomagnetic particles of this invention may be disposed in a medium so that they are either in liquid form, semi-solid form, or a solid form. The specification therefore, even prior to the present amendment, disclosed that the nanomagnetic particles could be disposed in a variety of carriers previously used for therapeutic compositions. Further, the specification specifically discloses a polymeric carrier in the form of an amino acid polymer matrix with magnetic particles embedded therein, which magnetic particles are disclosed to be replaced by the nanomagnetic particles of the invention. See bridging paragraph, pages 236-237.

Regarding the allegation in the Office Action that the specification and claim consider the particles in a binder distinct from the particles dispersed in a polymeric carrier, Applicants submit that the original specification does not disclose that these classes of materials, binders and polymeric carriers, are mutually exclusive. Rather, Applicants submit that the original specification does disclose that these materials are mutually compatible and in some embodiments the binder, in which there are particles, and the polymeric carrier, in which there are particles, may be the identically same material. The original specification refers to "binder carrier" and incorporates by reference USPN 6,099,999 and USPN 6,130,019 at page 342, lines 6-7. USPN 6,130,019 discloses a binder carrier comprising at least magnetic particles and a binder resin, the binder resin comprising a thermoplastic silicone-modified acrylic resin. USPN 6,099,999 discloses a binder carrier comprising at least magnetic particles and a binder resin, which is characterized in that the binder resin comprises a thermoplastic silicone-modified acrylic resin and an amino-group-containing resin. Another material disclosed by the original specification as being useful as both a binder and a polymeric carrier is cellulose. The original specification discloses that

cellulose may be used as a polymeric carrier at page 173, lines 18-22. The original specification discloses that cellulose may be used as a binder at page 29, lines 3-9.

Applicants have amended claims 29 and 30 to depend from claim 1, rather than claim 10, in response to the 35 U.S.C. §112 rejection of those claims.

The Office Action further alleges that the specification only teaches iron nitrides, which only contain distinct atoms (sic), and that there is no disclosure in the specification of nanoparticles of iron, nitrogen, and a third distinct atom. The Office Action further alleges that there is no disclosure in the specification of nanoparticles of iron, nitrogen, and aluminum, only iron nitrides or aluminum nitrides.

Applicants respectfully traverse this allegation. There is no claim reciting "nanoparticles of iron, nitrogen, and a third distinct atom". Claim 11 recites that "said third distinct atom is nitrogen"; claim 15 that depends from claim 11 recites that "said first distinct atom is iron"; and claim 16 that depends from claim 15 recites that "said second distinct atom is aluminum".

The specification discloses, "Referring to Figure 3, and in the preferred embodiment depicted therein, a phase diagram 100 is presented. As is illustrated by this phase diagram 100, the nanomagnetic material used in this embodiment of the invention preferably is comprised of one or more of moieties A, B, and C." Original specification, page 35, lines 4-7. The specification discloses, "In one embodiment, the moiety A is iron." Original specification, page 35, lines 11-12. The specification discloses, "One may use [as the B moiety] such elements as silicon, aluminum [Applicants' emphasis], boron, platinum, tantalum, palladium, yttrium, zirconium, titanium, calcium, beryllium, barium, silver, gold, indium, lead, tin, antimony, germanium, gallium, tungsten, bismuth, strontium, magnesium, zinc, and the like." Original specification, page 38, lines 13-16. The specification discloses, "In one preferred embodiment... the C material is nitrogen..." Original specification, page 39, lines 18. This disclosure teaches nanoparticles of the combination of iron, nitrogen, and aluminum. Further disclosure of the specific combination is at page 57 starting at line 11. A method for making the specific combination of FeAlN (and

FeAlO) is disclosed at page 59, line 9 through page 61, line 11, specifically identifying FeAlN at page 61, line 2.

The Office Action alleges that the specification fails to teach that the nanoparticles have the properties claimed in claims 99-105 and 152-155. Applicants respectfully traverse this allegation. The specification states at page 32, "The magnetic field is preferably imposed until the nano-sized particles within former 78... have a mass density of at least about 0.001 grams per cubic centimeter [claim 154]... a saturation magnetization of from about 1 to about 36,000 Gauss, a coercive force of from about 0.01 to about 5,000 Oersteds, and a relative magnetic permeability of from about 1 to about 500,000 [claim 99]." [Applicants' emphasis and claim annotation.] The original specification further recites, "In one embodiment, the nanomagnetic material has a saturation magnetization of from about 1 to about 36,000 Gauss." Page 50, lines 8-9. This disclosure supports properties claimed in claims 99, 100, and 105. The original specification discloses, "In one embodiment, the nanomagnetic material also has a coercive force of from about 0.01 to about 5,000 Oersteds." Page 50, lines 11-12. This disclosure supports properties claimed in claims 99, 101, and 102. The original specification also recites, "In one embodiment, the nanomagnetic material preferably has a relative magnetic permeability of from about 1 to about 500,000..." Page 50, lines 21-22. This disclosure supports the properties claimed in claims 99, 152, and 153. The original specification discloses, "In one embodiment, the nanomagnetic material preferably has a mass density of at least about 0.001 grams per cubic centimeter; in one aspect of this embodiment, such mass density is at least about 1 gram per cubic centimeter... In another embodiment, the material has a mass density of at least about 3 grams per cubic centimeter. In another embodiment, the nanomagnetic material has a mass density of at least about 4 grams per cubic centimeter." Page 51, line 15-22. This disclosure supports properties claimed in claims 103, 104, 154, and 155.

Applicant submits that the above arguments and the amendments, reply to the allegations of lack of support in the Office Action for the rejection under 35 U.S.C. §112, first paragraph. Based on the above arguments and amendments, the subject matter of the claims are fully described in the specification in a way as to reasonably

convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed. Applicants respectfully request that the rejection under 35 U.S.C. §112, first paragraph, be withdrawn.

REJECTIONS UNDER 35 U.S.C. §103(a), FIRST PARAGRAPH:

The Office Action rejects claims 1-6, 9-11, 15, 17-19, 28-30, 32-41, 121 and 124 under 35 U.S.C. §103(a) as being unpatentable over U.S. patent application publication 2005/0039848 in view of JP 6-199525. Applicants respectfully traverse.

In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992). Applicant submits that the present rejection is improper because at least one of the references upon which it relies for its basis is neither analogous art nor is reasonably pertinent to the particular problem with which the inventor of the present application was concerned.

U.S. patent application publication 2005/0039848 ("Kirsten") is neither analogous art nor is pertinent to the particular problem with which the inventors of the present application were concerned. Kirsten discloses a process for adhesive separation of bonded joints. Generally, Kirsten is concerned with, and addresses adhesive systems. Specifically, Kirsten is concerned with adhesive systems which are intended to facilitate the most efficient possible loosening of bonded joints. This is non-analogous to the present application, which unlike Kirsten, is not concerned with adhesive systems or the loosening of bonded joints.

Furthermore, Kirsten is not pertinent to the particular problem with which the inventors of the present application were concerned, providing an improved nanomagnetic particle useful for coating a medical device. Kirsten teaches the use of nano-scale particles to heat a matrix of adhesive in order to loosen joints bonded with said adhesive. By contrast, the present application is not concerned with the problem of heating a matrix of adhesive or otherwise loosening bonded joints. The present

application claims nanomagnetic particles in a polymeric carrier. The carrier is incidental to the purpose of the nano-scale particles, where in Kirsten, the nano-scale particles are intended to act upon the adhesive binder. Because Kirsten is neither analogous art nor is pertinent to the particular problem with which the inventor of the present application was concerned, it cannot correctly be used as a reference as a basis for a 35 U.S.C. §103(a) rejection. Because the 35 U.S.C. §103(a) rejection relies on Kirsten and because Kirsten cannot correctly be used as a basis for it, the 35 U.S.C. §103(a) rejection lacks sufficient basis. Applicants respectfully request that the 35 U.S.C. §103(a) rejection be withdrawn.

Patent Abstract of Japan JP 6-199525 ("Adachi") is neither analogous art nor is pertinent to the particular problem with which the inventors of the present application were concerned. Adachi discloses a process for production of a superfine particle of rare earth transition metal based compound useful as a raw material for the production of a high performance sintered permanent magnet. The industrial application in Adachi is "high performance sintering mold permanent magnet." Adachi, paragraph 0001. The problem solved in Adachi is "the magnitude of the particle obtained with conventional atomization technique -- at most -- it is submicron extent and the ultrafine particle with a high degree of sintering with a still smaller particle size is not obtained yet." Adachi, paragraph 0003.

Considering that the document from which this above quote is taken is computer translated and of imperfect precision, Applicants understand this above quote to mean that the problem being addressed in Adachi is the need to reduce the size from a micro-scale to a nano-scale of the rare earth transition metal particles being obtained for use as input material in a sintering operation.

Further, Adachi notes explicitly that the ultrafine particles prepared thereby are produced for use in sintering operations. Adachi, Abstract. That is, the problem in Adachi is the production of finer, smaller, sintering stock. The fact that Adachi is concerned with sintering very fine rare earth transition metal particles into one large mass as a permanent magnet is an important and explicit part of the technology and is an important and non-negligible difference between the problem addressed in Adachi

and the problem addressed in the present application. Adachi is not pertinent to the particular problem with which the inventors of the present application were concerned, providing an improved nanomagnetic particle useful for coating a medical device. Unlike the present application, Adachi is not concerned with particles for non-sintering operations. Because the 35 U.S.C. §103(a) rejection relies on Adachi which cannot correctly be used as a basis for it, Applicant respectfully requests that the 35 U.S.C. §103(a) rejection be withdrawn.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a) there must be (1) a suggestion or motivation to modify a reference, (2) a reasonable expectation of success, and (3) the modification of the reference must teach or suggest all claimed limitations. *In re Vaeck*, 947 F.2d 488 (Fed.Cir. 1991).

If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984). The combination of U.S. patent application publication 2005/0039848 ("Kirsten") with Patent Abstract of Japan JP 6-199525 ("Adachi"), would render Adachi unsatisfactory for its intended purpose.

The nanoparticles in Kirsten are combined with a binder matrix. The combination of binder matrix would add non-nanoparticle volume to the composition and render it unsuitable for sintering. That is, the addition of non-particle mass and volume to the nanoparticles would separate the particles, prevent them from adhering to one another during the sintering operation, create porosities, introduce impurities, and/or otherwise prevent formation of the desired output sintered product. Since the intended purpose in Adachi is to create an input product for a sintering operation, there is no suggestion or motivation to make a combination or modification which renders the product unsatisfactory for use in a sintering operation. Since the combination with Kirsten renders Adachi unsatisfactory for its intended purpose, there is no suggestion or motivation to combine Kirsten and Adachi. Because the 35 U.S.C. §103(a) rejection relies on a combination of Kirsten and Adachi and because there is no suggestion or motivation to combine Kirsten and Adachi, there is no *prima*

facie case made for a 35 U.S.C. §103(a) rejection. Applicant respectfully requests that the 35 U.S.C. §103(a) rejection be withdrawn.

The 103(a) rejection is based on the premise that the rare earth-iron-nitrogen nanosized magnetic particle of JP 6-199525 are identical to the claimed subject matter and thus must have a squareness, saturation magnetization, phase transition temperature and average coherence length that falls within the claimed ranges. Applicants respectfully traverse.

The particle size of the JP 6-199525 particles is not necessarily 10nm or less, but rather "several tens" (Abstract) or "dozens of nm" (Claim 1), with a specific number provided as 80nm or less (Paragraph 0012). Also, the combination of lanthanum (rare earth)-iron is not a combination of a first and second distinct element, but rather two "first distinct elements" (see Claim 2). The properties of a rare earth-iron-nitride will be different than those of an aluminum-iron-nitride, as aluminum is a second distinct element (see Claim 8).

Further, identity of the elements alone, or of the elements plus average particle size, does not guarantee a given set of properties. If that were so, the recitation of properties in the claims would be superfluous. The identity of the elements, plus the identity of the particle sizes of the species of elements with respect to each other and the spacing between them will provide a given set of properties as recited in the claims. For example, a nanomagnetic material made up of AlN particles of 3nm in size and FeN particles of 80nm in size will have different properties than an AlN-FeN nanomagnetic material made up of all particles within a size range of 10-15nm.

The relationship of particle size and spacing of the species and their effect on properties can be determined without undue experimentation by one of skill in the art, given the identity of the species, the particle size ranges, and the properties desired as disclosed in the present application.

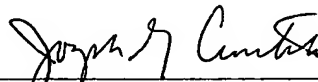
Neither US 2005/0039848 nor JP 6-199525, taken alone or in combination, provide a teaching of the desired claimed properties that can be achieved by a nanomagnetic material comprised of a first, second and third distinct atom with the recited particle size range.

CONCLUSION:

In view of the above amendments and remarks, Applicants respectfully request that the rejection of claims 1-12, 14-19, 26-30, 32-41, 99-105, 121-124, 126-128, and 152-155 under 35 U.S.C. §112, first paragraph be withdrawn, that the rejection of claims 1-6, 9-11, 15, 17-19, 28-30, 32-41, 121 and 124 under 35 U.S.C. §103(a) be withdrawn, that claims 20-25, 31, 106-120, 125 and 129-151 be rejoined, and that the Examiner issue a formal notice of allowance directed to claims 1-12, 15-41, and 99-155.

Should the Examiner have any questions about the above amendments or remarks, the undersigned attorney would welcome a telephone call.

Respectfully submitted,



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